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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/707,112

11/21/2003

Ming-Hung Lo

11761-US-PA

1111

31561

7590

05/05/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE

7 FLOOR-1, NO. 100

ROOSEVELT ROAD, SECTION 2

TAIPEI, 100

TAIWAN

EXAMINER

GURLEY, LYNNE ANN

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/707,112

Applicant(s)

LO ET AL.

Examiner

Lynne A. Gurley

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 8-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.



LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the amendment, filed 2/6/06 and to the remarks filed 11/4/05.

Currently, claims 1, 3-5 and 8-11 are pending.

Response to Arguments

1. Applicant's arguments, see page 6, regarding anticipation of ranges, filed 11/4/05, with respect to the rejection(s) of claim(s) 1 and 3 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Perng et al. (US 6,523,494) under 35 U.S.C. 103.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 5 and 8-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Perng et al. (US 6,523,494, dated 2/25/03, effectively filed 4/7/98).

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5. Perng also shows the method as claimed with a substrate (layers 203-229 in fig. 2 and 306 in fig. 3) having a plurality of device structures and at least an interconnect thereon; forming a patterned metallic layer (246 or 305, in figs. 2 and 3, respectively); performing a semi-atmospheric chemical vapor deposition process with liquid TEOS and ozone inside a reaction chamber 302/308 (column 11, lines 1-67; column 12, lines 1-6) to form a first passivation layer 302/312/308 directly on the metallic layer, wherein the liquid TEOS flowing into the reaction chamber has a flow rate between 500 sccm to 3000 sccm and the ozone flowing into the reaction chamber has a flow rate between 500 sccm to 15000 sccm (column 11, lines 19-25); and forming a moisture impermeable second passivation layer over the first passivation layer (column 12, lines 7-15). The pressure inside the reaction chamber during the semi-atmospheric chemical vapor deposition process is between about 20 to 750 Torrs (column 11, lines 23-25, lines 58-60). The semi-atmospheric chemical vapor deposition process is carried out at a temperature between about 200 to 600 degrees C (column 11, lines 30-33, lines 56-60). The first passivation layer comprises a silicon oxide layer.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perng et al. (US 6,523,494, dated 2/25/03, filed 9/12/00).

10. Perng shows the method as claimed with a substrate (layers 203-229 in fig. 2 and 306 in fig. 3) having a plurality of device structures and at least an interconnect thereon; forming a patterned metallic layer (246 or 305, in figs. 2 and 3, respectively); performing a plasma-enhanced chemical vapor deposition process to form a first passivation layer 302 (column 10, lines 65-67; column 11, lines 1-18) directly on the metallic layer 246 or 306, wherein the plasma-enhanced chemical vapor deposition process is carried out at a processing pressure between about 21 to 25 Torrs (column 11, lines 1-3, note that although the reference states about 1-20

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Torr and the claim states about 21-25 Torr, the Examiner interprets the word “about” to include, reasonably, +/- 10% difference, which would have Perng incorporate 20-22 Torr. This is a prima facie case of obviousness according to MPEP 2144.05) and with a processing power between about 1 to 45 Watts (column 11, lines 11-13, note that although the reference states about 50-500 Watts, for the low-frequency RF, and the claim states about 1-45 Watts, the Examiner interprets the word “about” to include, reasonably, +/- 10% difference, which would have Perng incorporate at least the upper end range from about 40-45 Watts. This is a prima facie case of obviousness according to MPEP 2144.05). The first passivation layer comprises a silicon oxide layer.

11. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perng et al. (US 6,523,494, dated 2/25/03, filed 9/12/00) in view of the Admitted Prior Art ([0006]-[0007] of the specification).

12. Perng shows the method substantially as claimed and as discussed in the previous paragraphs. Additionally, Perng shows that a cap layer (i.e. the second passivation layer) is deposited over the PECVD layer (col. 12, lines 7-14).

Perng lacks anticipation only in not teaching that the second passivation layer is silicon nitride.

The Admitted prior art teaches that it is conventional to deposit the first passivation layer of PECVD silicon oxide and a second passivation layer of silicon nitride by PECVD.

It would have been obvious to one of ordinary skill in the art to have deposited the cap layer in Perng of PECVD silicon nitride, in the process of Perng, with the motivation that

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conventionally a cap layer, in interconnect technology, functions as a moisture impermeable passivation layer and with the motivation that the Admitted Prior Art teaches that it is conventional to cap the PECVD silicon oxide passivation layer with a PECVD silicon nitride passivation layer. Additionally, Perng teaches that the cap layer is deposited by PECVD.

Response to Arguments

13. Applicant's arguments filed 11/4/05 have been fully considered but they are not persuasive. In response to Applicant's remarks, page 6, the record has been clarified to correctly reflect the case of prima facie case of obviousness regarding the overlapping ranges.

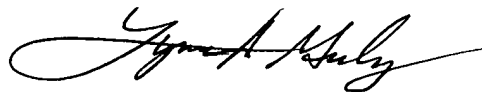
14. In response to Applicant's remarks, page 7, the surface treatment step is not precluded, and the elimination of damages to the metallic surface during the deposition process has not been claimed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300 as of 7/15/05.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lynne A. Gurley
Primary Patent Examiner
TC 2800, Art Unit 2812

LAG
April 30, 2006